

KOGAN, L.M.; MURZAKAYEV, F.G., starshiy rauchnyy sotrudnik

Safety measures in the use of hexachlorobutadiene and polychlorobutanes. Zashch. rast. ot vred. i bol. 9 no.9:30-31 '64.

(MIRA 17:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh sredstv zashchity rasteniy i Ufimskiy nauchno-issledovatel'skiy institut gigyeny i professional'nykh zabolevaniy.

"APPROVED FOR RELEASE: 09/18/2001

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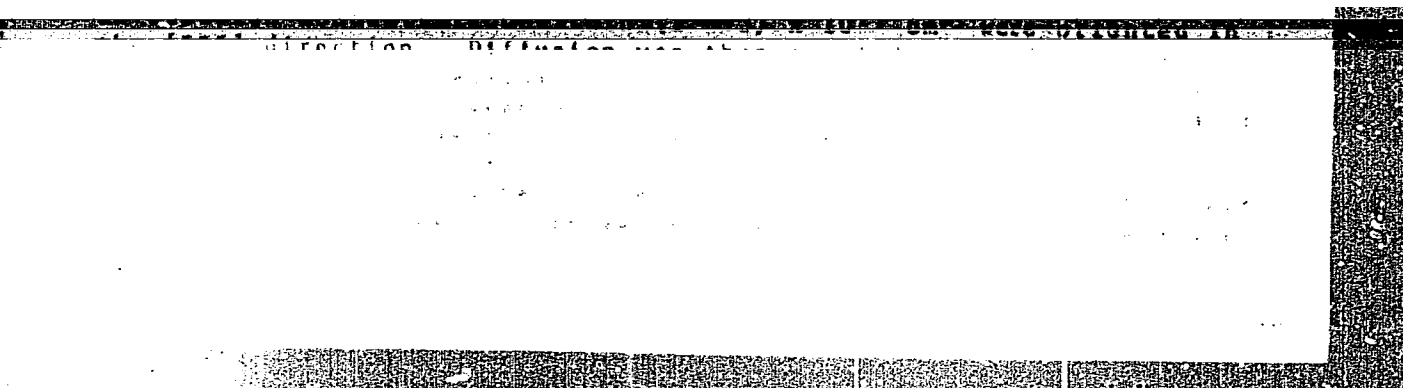
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KOSHCHENKO, K.A.; SKRYABIN, G.K.; YEROSHIN, V.K.; KOQAN, L.M.; TORGOV, I.V.

Hydrolysis of complex steroid esters with the help of Mucor
fungi. Prikl. biokhim. i mikrobiol. 1 no.2:181-185 Mr-Apr
'65. (MIRA 18:11)

1. Institut mikrobiologii AN SSSR i Institut khimii prirodnikh
soyedineniy AN SSSR.

31106-66 EWT(m)/FWP(1) RM
ACC-NR: AP5028281 (A) SOURCE CODE: UR/0020/65/165/002/0337/0340

AUTHOR: Rabovskaya, N. S.; Kogan, L. M.

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet); All-Union Scientific Research Institute on Plant Protection by Chemistry (Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh sredstv zashchity rasteniy)

TITLE: Radiolysis of hexachlorocyclopentadiene

SOURCE: AN SSSR. Doklady, v. 165, no.2, 1965, 337-340

TOPIC TAGS: x ray irradiation, ethylene, butadiene

ABSTRACT: Radiolysis of hexachlorocyclopentadiene proceeded analogously to that of tetrachloroethylene or hexachlorobutadiene. Twenty ml. of hexachlorocyclopentadiene was placed in a Mo-glass ampule and the ampule was sealed without the removal of air. The radiolysis of hexachlorocyclopentadiene was performed at 20C, using 0.66×10^{22} - 15.7×10^{22} ev/ml. doses at the 1.95×10^{16} - 3.82×10^{16} ev/ml. sec. rate. With an increase of irradiation dose, the conversion proceeded fast at first and then became slower. After distilling the residue of hexachloropentadiene, the reaction products were separated by rectification in a vacuum with a subsequent freezing-out of crystals which formed in different fractions while standing for 10-15 days. The

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UDC: 547.514.72

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CIA-RDP86-00513R000723610014-7"

KOGAN, L. M.

20-2-28/62

AUTHOR
TITLE

ZIMAKOV, P.V., and KOGAN, L.M.
On Two Reaction Trends in the Dehydrochlorination of Lower Alkylene
Chlorohydrins
(O dvukh napravleniyakh reaktsii degidroklorirovaniya nizshikh alkilen-
khlorgidrinov, Russian)
Doklady Akademii Nauk SSSR, 1957, Vol 115, Nr 2, pp 297-300 (U.S.S.R.)

PERIODICAL
ABSTRACT

In the year 1959 it will be hundred years since the description by A. Wurz of the reaction mentioned in the title. At that time a new compound, ethylene chloride, was for the first time produced in an alkaline medium. At present this reaction forms the basis of the commercial production of ethylene by means of chlorine. No note was hitherto taken of the fact that this substance is always obtained with an admixture of 1 - 2 % acetaldehyde, if the reaction is performed with application of milk of lime. These admixtures can develop due to a secondary isomerization reaction of ethylene oxide. In 1939 a French patent was published concerning the formation of considerable quantities of aldehydes (or ketones) beside the α -oxides on dehydrochlorination of aliphatic chlorohydrins in the environment of "milk of Magnesia". The subject of the patent did not draw the attention of chemists to the two-way reactivity of the simple compound (ethylene chlorohydrin). Some years ago the authors made thorough investigation of the dehydrochloro-

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On Two Reaction Trends in the Dehydrochlorination of Lower Alkylene
Chlorohydrins

ration of ethylenechlorohydrin (denoted ECH in the following) in various media and conditions. The method of the French patent yielded up to 35 % of ethyleneoxide and up to 50 % acetaldehyde. The authors proved that ethylene glycol develops only in the hydration of the primarily-forming ethyleneoxide. Acetaldehyde, as the practically only reaction product (98%), with small admixtures of ethyleneoxide develops in a boiling water suspension of nickeloxide hydrate. This proves that even such a simple compound as ECH, according to the nature of reagents acting on it, distinctly shows two reaction trends. It was interesting to study the particularities of the dehydrochlorination of ECH. In order to make the experimental checking of the above-mentioned assumption (isomerization) easier, the authors used propylenechlorohydrin (=PCH), since this compound exists in 2 (α - and β -) isomeric forms. Its dehydrochlorination takes place just as easily as that of ECH, but it usually leads to a yield of propylene oxide higher than 85%. The causes of the small yield have not been determined.

Conclusions: 1.) Propion-aldehyde in greater quantities develops on dehydrochlorination of PCH only in suitable media: aqueous suspensions of magnesium- and especially nickel-hydroxide. This is in agreement with the rule governing in the case of ECH. 2.) Propion aldehyde de-

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KOGAN, L.M.

Continuous countercurrent unit for neutralizing substances
immiscible with water. Khim.nauk i prom. 3 no.5:675 '58.

(MIRA 11:11)

1. Nauchno-issledovatel'skiy institut po udobreniyam i insekto-
fungitsidam im. Samoylova.

(Chemistry, Technical)

SOV/ 64-58-4-5/20

AUTHORS: Zimakov, P. V., Doctor of Chemical Sciences, Kogan, L. M.,
Candidate of Technical Sciences

TITLE: On the Influence of Temperature on the Process of the
Hypochlorination of Ethylene (O vliyanii temperatury na
protssess gipokhlorirovaniya etilena)

PERIODICAL: Khimicheskaya promyshlennost', 1958, Nr 4, pp. 210 - 213 (USSR)

ABSTRACT: Already Carius (Ref 1) observed the reaction between ethylene
and hypochlorous acid; however, a technological use of this
reaction took place only according to the synthesis by
Gomberg (Ref 2). Greatly differing data exist on the influ-
ence of the temperature on the course of reaction: Brooks
(Ref 21) maintained that the hypochlorination is to be car-
ried out at low temperatures; Zapadinskiy (Ref 3) worked at
0 - 2°, while Tropsch and Kassler (Ref 10) showed that the
reaction takes a better course at 40 - 60° than at 0 - 30°.
According to Demask and Kobe (Ref 15) a rise of temperature
is to supply a better yield, while Murray (Ref 24) finds 30°
to be the upper limit. These contradictions made the authors

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SOV / 64-58-4-5/20

On the Influence of Temperature on the Process of the Hypochlorination of Ethylene

of this paper assume that the distribution of ethylene and with it its transformation velocity into the solution are dependent on temperature. For this purpose three experimental series were carried out at temperatures of from 0 - 70° and in the case of different acetylene distribution; in the first case a distribution of the gas was arranged by a Schott filter Nr 1, in the second case by openings in the supply tube, and in the third case by means of 1 mm openings. From the results obtained may be seen that in the first series of experiments a rise of temperature leads to an increase in the yield of ethylene chlorohydrin (at 70° up to 90 %). The second series showed that under these conditions a change of temperature within a wide range did not exert any influence on the yield and that on the average it amounts to 20 %. In the third series of experiments a rise of temperature caused a decrease of the ethylene chlorohydrin yield, so that it was 40 % at 90° and 55 % at 60°. In order to explain these contradicting results the process of hypochlorination is shown schematically and two basic reactions are assumed - the solution of ethylene and the chlorohydrolysis - which influence the yield. The hydrolysis was already investigated

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On the Influence of Temperature on the Process of the Hypochlorination of Ethylene

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by Yakovkin (Ref 25) who observed an increase in the degree of hydrolysis with the rise of temperature; for the further classification an investigation of the solution kinetics is carried out. It is assumed that for the first experimental series a "kinetic" factor is decisive, while the third experimental results depend on a "diffuse" factor, and the second series has a balancing effect of the temperature on the two mentioned factors; such an independence of the temperature may be observed after all. Based on the results obtained the authors then conclude that a rise of temperature has a favorable effect in the case of a fine distribution of the gases, while in a coarse distribution the temperature factor exerts a negative effect. Thus for obtaining a maximum yield of ethylene chlorohydrin the corresponding conditions must be prepared; the effect of the optimum temperature will be the greater, the greater the velocity of the transition of ethylene from the gaseous phase into the solution - the medium of the reaction. There are 1 figure and 25 references, 10 of which are Soviet.

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30V/64-58-4-5/20

On the Influence of Temperature on the Process of the Hypochlorination
of Ethylene

1. Ethylenes--Halogenation
2. Chemical reactions--Temperature factors

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5(3)

SOV/153-58-5-21/28

AUTHORS:

Kogan, L. M., Burmakin, N. M., Chernyak, N. V.

TITLE:

Production of Hexachloro Butadiene (Polucheniye gekсахlor-butadiyena)

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 5, pp 126-130 (USSR)

ABSTRACT:

Hexachloro butadiene-1,3 ($\text{CCl}_2\text{-CCl-CCl-CCl}_2$) is a chemically rather inert substance which behaves as a saturated compound since its double bonds are screened off by chlorine atoms (Refs 1, 3, 4). Most of its reactions are connected with fluorization. Its constants and fields of application are recalled. The production of hexachloro butadiene by thermal chlorination of polychloro butanes (Ref 2) is the most agreeable. Although the last stages of this process supply high yields of the final product it is devaluated by the multi-stage and complicated production of the initial substances. The task of the present paper was the determination of conditions not having those deficiencies. First of all, the reaction temperature was to be decreased as it was close to the upper limit of the usability of nickel which is the only con-

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Production of Hexachloro Butadiene

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struction material possible in this case. This aim was accomplished by the chemical inertness of hexachloro butadiene which can remain in the reaction zone for a longer period without suffering any changes. The considerable usual chlorine excess hitherto made use of was decreased by 30%. The reaction temperature amounted to 350-425°, parallel experiments were carried out at 475°. Table 1 gives the results obtained. They tend to show the successive production of hexachloro butadiene at 350-425°. The high sensitivity of the yield to the degree of the chlorination of butane was another deficiency to be removed. This was accomplished by the chlorination on kieselguhr. 3) Finally, the authors proved that the production of hexachloro butadiene takes place during the reaction between chlorine and the product of a short chlorination of butane by trichloro butane. The process takes place on kieselguhr at 350-425° with a yield of 70%. There are 3 tables and 21 references, 8 of which are Soviet.

ASSOCIATION:

Card 2/3

Nauchnyy institut po udobreniyam i insektofungitsidam i Moskovskiy institut tonkoy khimicheskoy tekhnologii, Kafedra tekhnologii osnovnogo organicheskogo sinteza (Scientific Institute

SOV/153-58-5-21/28

Production of Hexachloro Butadiene

for Fertilizers and Insectofungicides and Moscow Institute for
Fine Chemical Technology, Chair of the Technology of Organic
Basic Synthesis)

SUBMITTED: January 6, 1958

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KOGAN, L. M.

AUTHORS: Kogan, L. M., Burmakin, N. M., Chernyak, N.V. 79-1-6/63

TITLE: On the Chemism of the Processes of the Intense Chlorination of Pentane (O khimizme protsessov glubokogo khlorirovaniya pentana)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 1, pp. 27-30 (USSR)

ABSTRACT: The chlorination of normal butane to the mono- and di-derivatives was investigated by many scientists. But there exist fewer works on the synthesis of polychloropentanes with more than two of chlorine atoms in the molecule. The process of intense chlorination of pentane was phototechnically realized in a flowing system in the center of the reaction products, hexa- and heptachloropentane. Under these conditions a considerable destruction of the molecules took place. The chlorination of these pentanes with infusorial earth and iron chloride at high temperatures led to hexachlorocyclopentadiene as the main product. This conversion with the formation of hexachlorocyclopentadiene, which is used as initial product for the manufacture of highly effective insecticides, may also later be used in the production of

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On the Chemism of the Processes of the Intense Chlorination
of Pentane

79-1-6/63

other important technical products. It is the task of the present paper to investigate the conversion of polychloropentanes to hexachlorocyclopentadiene. The methods employed by the authors and described in publications for the synthesis of this pentadiene led to decomposition products and an undistillable residue, which rendered the determination of the process of reaction very difficult. Therefore the conversion of the polychloropentanes was considerably changed and their chlorination performed in the presence of infusorial earth at 350°C. Thus the yield of the final product was substantially reduced, but it was possible to isolate the intermediate products. Beside hexachlorocyclopentadiene octachloropentadiene-1,3 and octachlorocyclopentene as destruction products were determined in the reaction mixture. The conversion of the polychloropentanes to hexachlorocyclopentadiene takes place according to the scheme: polychloropentane → nonachloropentane → octachloropentadiene-1,3 → octachlorocyclopentene → hexachlorocyclopentadiene (see formulae). This scheme of the conversion of polychloropentanes in the presence of chlorine at high temperatures practically by far deserves

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On the Chemism of the Processes of the Intense Chlorination
of Pentane

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preference over all other schemes.

ASSOCIATION: Scientific Institute for Fertilizers and Insecticides
(Nauchnyy institut po udobreniyam i insektofungisidam)

SUBMITTED: January 7, 1957

AVAILABLE: Library of Congress

Card 3/3

1. Chemistry 2. Pentane-Chlorination

MOGAN, I.M.; BURMAKIN, N.M.; IGNATOVA, N.P.; CHERNYAK, N.V.

Formation of octachloro -1,3-pentadiene. Zhur.prikl.khim. 31
no.3:507-508 Mr '58. (MIRA 11:4)
(Pentadiene)

KOGAN, L.M.; BURMAKIN, N.M.

Production of hexachlorocyclopentadiene. Zhur. prikl. khim. 31
no.10:1585-1591 O '58. (MIRA 12:1)

1. Nauchnyy institut po udebreniyam i insektofungitsidam.
(Cyclopentadiene)

5(1)

SOV/64-59-5-24/28

AUTHOR:

Kogan, L. M., Candidate of Technical Sciences

TITLE:

Hexachlorocyclopentadiene - a New Raw Material for the Production of Heat-resisting Polymers

PERIODICAL:

Khimicheskaya promyshlennost', 1959, Nr 5, pp 448 - 458 (USSR)

ABSTRACT:

A detailed survey dealing with the explanations and data on the application of hexachlorocyclopentadiene to the production of several synthetics is given. The details base exclusively on foreign, mainly American publication data. The paper is divided into 2 parts, the larger part dealing with the monomers and polymers, obtained from hexachlorocyclopentadiene, the other part dealing with the ways of producing hexachlorocyclopentadiene. The application of the adduct of hexachlorocyclopentadiene with the anhydride of maleic acid, exhibiting the greatest practical importance (named HET-anhydride in USA), as well as the synthetics manufactured therefrom and finally their different properties are explained in details (Tables 1-4). Comparative data of heat-proof synthetics, obtained from hexachlorocyclopentadiene, of the anhydride of phthalic acid, of the hardening with styrene (Tables 5,6) and of their production process also are given. In

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Hexachlorocyclopentadiene - a New Raw Material for the SOV/64-59-5-24/28
Production of Heat-resisting Polymers

the following the production of polymers, as for example silicon resin, is listed among other application methods of hexachlorocyclopentadiene, like the preparation of fluorination products therefrom and its reaction with SbF_5 . Linear polymers (Tables 6,7), produced on the basis of hexafluoroamylene glycol as well as synthetics (Table 8), produced from polyhexafluoroamyleneadipates are mentioned and discussed. The production methods of hexachlorocyclopentadiene are parted into 4 groups, and it is stated that these methods, that base on the chlorination of n-heptane, of 2-methyl butane, on the amylenes or their mixtures, and on the chlorination of pentadiene-1,3, do not have the disadvantages of other methods. The properties of the hexachlorocyclopentadiene, produced by means of the different methods, are compared (Table 9). There are 7 figures, 9 tables, and 63 references, 1 of which is Soviet.

ASSOCIATION: Nauchnyy institut po udobreniyam i insektofungitsidam im. Ya. V. Samoylova (Scientific Institute of Fertilizers and Insectofungicides imeni Ya. V. Samoylov)

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5(3)

AUTHOR:

Kogan, L. M., (Moscow)

SOV/74-28-2-2/5

TITLE:

Chlorinated Hydrocarbons (Khloriglerody)

PERIODICAL:

Uspekhi khimii, 1959, Vol 28, Nr 2, pp 133-167 (USSR)

ABSTRACT:

In the present paper the main methods of synthesizing chlorinated hydrocarbons were closely considered. Chlorinated hydrocarbons can be obtained from products of chlorination in various ways: 1) by exhaustive chlorination of the initial compounds containing the same number of carbon atoms as the nascent compound; 2) by destruction of chlorinated hydrocarbon molecules containing a larger number of carbon atoms than the molecules of chlorinated hydrocarbons formed; 3) by means of dechlorinating chlorinated hydrocarbons whereby the number of carbon atoms remains invariable; 4) by means of dehydrochlorination of polychlorine derivatives whereby the number of carbon atoms remains invariable; 5) by interaction between polychlorine derivatives and polychloro olefins in the presence of a hydrogen atom in one of the reactive compounds and by subsequent separation of the elements HCl (reaction of Prins); 6) by means of synthesis from polychloro paraffins containing less carbon atoms than the molecules of the final chlorinated

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hydrocarbons; 7) by hydrogenation of chlorinated hydrocarbons under separation of HCl and retaining the number of carbon atoms; 8) by means of isomerization of unsaturated chlorinated hydrocarbons. In this paper the reactions are mainly discussed which take place under application of the three first-mentioned methods. These processes are subdivided into two groups: 1) chlorination with gaseous chlorine. In chlorinating lowest as well as aromatic hydrocarbons corresponding chlorinated hydrocarbons are formed. In addition to the main reaction a destruction of the carbon skeleton is observed. Cyclization takes place in the case of chlorinating hydrocarbon atoms containing at least 5 carbon atoms in the molecule. The reactions investigated take place thermally by the effect of the radiation, of the catalysts and initiators. When chlorinating in the liquid phase the photochemical process and homogeneous catalysts are applied. In the gas phase heterogeneous catalysts are used. Chlorination in the liquid phase takes place in an apparatus with continuous flow in the most effective way. The process takes place at increased temperature to the boiling point of the reaction liquid. The main method for synthesizing chlorinated hydrocarbons under

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normal pressure is that of chlorination in the gas medium. In this case, temperature amounts to several 100°. The reaction takes place in an apparatus with continuous flow. A convenient method is the so-called oxidizing chlorination. This reaction consists of the main process and the oxidation of HCl to elementary chlorine used for chlorination. 2) Chlorination with liquid chlorine. The composition of the compounds to be formed depends only little on the composition of the initial products and the conditions of the reaction. In the case of transformation of polychlorides with less than 5 carbon atoms in the molecule the reaction products are mainly or exclusively CCl_4 and C_2Cl_6 . In the reaction of polychloro paraffins containing 5 and more carbon atoms in the molecule $\text{cyclo-C}_5\text{Cl}_8$ is obtained in addition to the compounds already mentioned. Presumably free radicals are formed which either react with each other or are decomposed or react with chlorine. In the first two cases resin or coke is obtained. Chlorinated hydrocarbons are formed with chlorine. In initial chloro paraffin more chlorine than a certain minimum quantity

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depending on reaction conditions between chloro paraffin and liquid chlorine must be contained. Otherwise coke is obtained. In the case of a chlorine content guaranteeing an actual excess in the reaction zone coke, resins as well as other compounds of unclarified composition are formed from polychloro paraffins. Provided a certain ratio between the reaction products is kept only the above-mentioned destruction products are formed. An increase of the chlorine content does not effect the composition. A higher chlorine concentration favors the collision of free radicals with chlorine, thus reducing the production of soot and coke and increasing the yield of chlorinated hydrocarbons. For this reason the temperature must guarantee the course of reaction in the liquid phase. At a temperature exceeding 200° the main reaction is the chlorinolysis. The yield increase of chlorinolysis products occurs in the following order: $CCl_4 > C_2Cl_6 > cyclo-C_5Cl_8$. This holds if the process takes place on the whole in the liquid phase. Pressure represents a positive factor. The lower limit is important for carrying out the process in the liquid phase. The maximum limit is dependant on the possibilities of the apparatus and communications. In order to guarantee a complete chlorinolysis

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Chlorinated Hydrocarbons

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of chloro paraffins a certain period of its contact with liquid chlorine is necessary. A reduction of time leads to a smaller yield of the destruction products. A prolongation does not effect the yield. This fact is caused by the stability of the destruction products. One of the technological advantages of this reaction is a certain material inertia of the system. There are 16 figures, 4 tables, and 176 references, 39 of which are Soviet.

Card 5/5

5 (3)

AUTHORS:

Zimakov, P. V., Kogan, L. M.

SOV/20-127-2-26/70

TITLE:

The Mechanism of Aldehyde Formation in the Dehydrochlorination of Lower Alkylene Chlorohydrins

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 2, pp 329-332 (USSR)

ABSTRACT:

The authors proved (Ref 1) that the transformation of the substances last mentioned in the title (ethylene-, propylene chlorohydrin) into a corresponding α -oxide or aldehyde with good yields depends on the character of the medium in which the reaction proceeds. However, only one isomer, i.e. the β -isomer, of propylene chlorohydrin is transformed into an aldehyde, the α -isomer is not capable of being transformed (see Scheme). The transformation of the mentioned substances into α -oxides proceeds in media with a high pH according to the Würtz-(Vyurts-) reaction (in "milk of lime"). They are transformed especially smoothly into aldehydes in a suspension of nickel hydroxide (Ref 1). The aldehyde yields in "milk of magnesia" are as well considerable (Ref 2). The authors give then considerations with respect to the probable mechanism of such a double-track reactivity of such simple compounds as those mentioned in the title. They have two easily polarisable Cl- and O-atoms which are in a

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The Mechanism of Aldehyde Formation in the
Dehydrochlorination of Lower Alkylene Chlorohydrins

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β -position to each other. This favors a maximum reciprocal effect which is often accompanied by the change of the valence stages of both atoms or of one of them. The yperite molecule may serve as an example of such an "activity" of the mentioned β -position of the chlorine atoms and of an easily polarisable sulphur. Its very special toxicity is explained by the slight change in the valence of the mentioned atoms (Ref 3). The activity of the polarisable atoms is also very high in the two mentioned chlorohydrins in consequence of their structural peculiarities. The reactivity is due to this fact. Even an anhydrous ethylene chlorohydrin produces a certain quantity of diethylene-glycol-chlorohydrin in the case of a long storage. An equivalent HCl-quantity becomes liberated in this case (Ref 4). This transformation is caused by the transition of single chlorohydrin molecules into an "active" polar form with changed valence stages of oxygen and chlorine (Ref 5). The Würtz reaction which leads to the formation of ethylene-oxide proceeds through such an active molecule form of chlorohydrin with oxonium oxygen and with ion chlorine (Ref 6). The propylene oxide is produced from propylene chlorohydrin in the same way. Its two isomers (α and β)

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react practically equally. The ethylene-oxide produced in the practical carrying-out of the Würtz reaction is always accompanied by a small admixture of acetaldehyde (Ref 7). The formation of the latter increases according to reference 8 with decreasing acidity of the medium. At present it must be assumed that the ethylene chlorohydrin molecule may assume a second active "chloronium" form under splitting off of a hydroxyl ion in media not containing an excess of hydroxyls. This must be assumed from the ethylene chlorohydrin formation in the ethylene chlorination in the aqueous medium (Ref 10). Analogous active forms exist for propylene chlorohydrin, however, with a different degree of stability (Ref 11). Nickelous hydroxide $N(OH)_2$ in suspension is an especially suitable medium, as was already mentioned (Ref 1). It may be assumed that the interaction of ethylene chlorohydrin in the aqueous medium passes in the case of boiling (100°) several stages explained in the scheme. Such alcoholate forms of the nickel compounds are described in reference 13. The considerable tendency of nickel to the formation of a basic chloride is essential, whereas the intermediate compound with

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The Mechanism of Aldehyde Formation in the
Dehydrochlorination of Lower Alkylene Chlorohydrins

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alkylene chlorohydrin favors the reconstruction of the molecule of the latter under splitting off of an acetaldehyde. The α -isomer of propylene chlorohydrin which does not incline to the splitting off of hydroxyl and to the formation of chloronium does not react at all with the nickelous hydroxide (Ref 1). The two chains of the interactions are simultaneous and parallel in the "milk of magnesia" in which the yield of α -oxides and aldehydes is approximately equal (Ref 14). There are 14 references, 8 of which are Soviet.

PRESENTED: April 1, 1959, by B. A. Kazanskiy, Academician
SUBMITTED: March 30, 1959

Card 4/4

5.3600

77532
SOV/80-33-1-41/49

AUTHORS:

Volodkovich, S. D., Vol'fson, L. G., Kogan, L. M.
Mel'nikov, N. N., Sapozhkov, Yu. N.

TITLE:

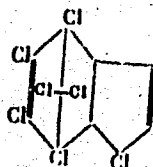
Concerning the Preparation of Insecticide "Heptachlor"

PERIODICAL:

Zhurnal prikladnoy khimii, 1960, Vol 33, Nr 1, pp 227-233 (USSR)

ABSTRACT:

"Heptachlor" or 3,4,5,6,7,8,8-heptachloro-4,7-endomethylene-3a,4,7,7a-tetrahydroindan has the following properties: white crystals with camphor odor, dissolves well in organic solvents.



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Hexachlorocyclopentadiene was condensed with cyclopentadiene and 4,5,6,7,8,8-hexachloro-3a,4,7,7a-

Concerning the Preparation of Insecticide
"Heptachlor"

77532
SOV/80-33-1-41/49

tetrahydro-4,7-endomethyleneindan (chlordan) was formed. The latter was chlorinated and heptachlor was obtained (yields are not given). Heptachlor content in the reaction mixture is increased to 70% by chlorination for 30 to 120 minutes. The optimal conditions for the formation of chlordan in CCl_4 are 10% excess of C_5H_6 , at $80-85^\circ$, duration 30-40 minutes. For the chlorination of chlordan, the following conditions are recommended: the presence of activated (at 120° , for 1-2 hours) kieselguhr and a temperature not over 50° . Heptachlor content is about 70%. The yield of heptachlor is determined by the total amount of introduced chlorine and, with certain limits, is independent of the feed rate of chlorine and duration of chlorination. There are 6 figures; and 29 references, 4 Soviet, 16 U.S., 3 German, 4 U.K., 2 French. The 5 most recent U.S. references are: H. Bluestone, Y. A. Tajima, R. E. Lidov, Am. Pat. 2818445; M. Kleinman, *ibid.*,

Card 2/3

Concerning the Preparation of Insecticide
"Heptachlor"

77532

SOV/80-33-1-41/49

2741640; ibid., 2741639; ibid., 2741641; H. Bluestone, R.
E. Lidov, J. H. Knaus, P. W. Hoverton, ibid., 2576666.

ASSOCIATION:

Research Institute of Fertilizers and Pesticides
(Nauchnyy institut po udobreniyam i insektofungitsidam)

SUBMITTED:

June 3, 1959

Card 3/3

KOGAN, L.M.; BURMAKIN, N.M.

Nature of the synthesis of hexachlorocyclopentadiene from
cyclopentadiene. Zhur.prikl.khim. 33 no.7:1653-1660
J1 '60. (MIRA 13:7)

1. Nauchnyy institut po udobreniyam i insektofungitsidam imeni
Ya.V. Samoylova.
(Cyclopentadiene)

KOGAN, L.M.; PRINTS, Ya.I.

Effect of hexachlorobutadiene on the phylloxera of the
grapevine. Dokl.AN SSSR 133 no.1:246-248 J1 '60.
(MIRA 13:7)

1. Nauchnyy institut po udobreniyam i insektofungitsidam i
Institut biologii Moldavskogo filiala Akademii nauk SSSR.
Predstavleno Akademikom S.I.Vol'fkovichem.
(GRAPES—DISEASES AND PESTS)
(PHYLLOXERA)
(CHLORINE ORGANIC COMPOUNDS)

20489

15.8220

2209

S/191/61/000/003/013/015
B124/B203

AUTHORS: Kogan, L. M., Safray, B. A., Dinzbarg, B. N., Polinskiy, S. L.

TITLE: New incombustible plasticizers of PVC

PERIODICAL: Plasticheskiye massy, no. 3, 1961, 67-69

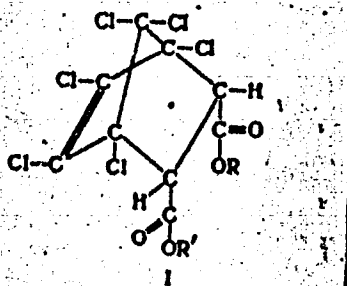
TEXT: As is known, the compatibility with PVC rises with the polarity of the plasticizer, whose efficiency is determined by the aliphatic and also by the cyclic part of its molecule. Esters with several chlorine atoms in the molecule are of interest in this connection. Direct chlorination of the ester or of the corresponding acid is, however, difficult; the synthesis of these compounds is simpler from compounds containing chlorine in the molecule, particularly from acids of polycyclic structure with several chlorine atoms, and from aliphatic alcohols. As PVC plasticizers, the authors synthesized and tested the diesters of 1,4,5,6,7,7-hexachloro bicyclo-(2,2,1)-5-heptene-2,3-dicarboxylic acid (so-called chlorendic acid) and of aliphatic alcohols. They called these compounds dialkyl chlorendates. Dialkyl chlorendate molecules have the following structure:

Card 1/6

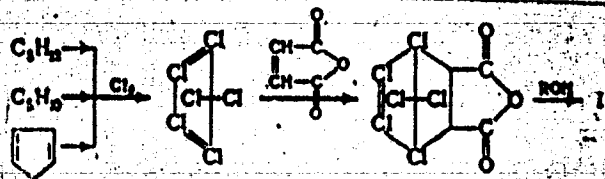
20489

S/191/61/000/003/013/015
B124/B203

New incombustible plasticizers of PVC



The synthesis of such a compound can be represented as follows:



Chlorine and petroleum hydrocarbons are initial substances for the new

Card 2/6

20489

New incombustible plasticizers of PVC

S/191/61/000/003/013/015
B124/B203

plasticizers. The authors tested diesters with the same aliphatic radicals containing 1-8 carbon atoms. Tables 1 and 2 give the results of determination of the properties of products obtained from PVC with esters of chlorendic acid, i.e., dimethyl ester of chlorendic acid (C-561) and dibutyl ester (C-564) alone and combined with dibutyl phthalate (DBP). The initial material used was PVC resin of the type ПД-1 (PF-1) (according to ГОСТ 3119-46 (GOST 3119-46)) with a viscosity of the 1% solution in dichloro ethane of 2.3 cp, an ash content of 0.15%, a destruction temperature of 165°C, a thermostability of 25 min, a basicity of 0.04%, traces retained on sieve- 015 (GOST 6613-53). Table 3 gives the results of tests made on plasticized PVC films. The results reveal that the new synthetic plasticizers are superior to DBP with respect to incombustibility, higher aging resistance, and reduced stickiness. The authors thank Professor A. A. Berlin for his help. There are 3 tables and 10 references: 9 Soviet-bloc and 1 non-Soviet-bloc.

Card 3/6

VOL'FSON, L.O., KOGAN, L.M.

Chlorinated insecticides made from hexachlorocyclopentadiene. Khim.
prom. no.10:8-13 0 '61.

(MIRA 15:2)

(Insecticides)

32570

8/595/60/000/000/005/014
E196/E485

5.3600

2209

AUTHOR:

Kogan, L.M.

TITLE:

Preparation of hexachlorocyclopentadiene from petroleum hydrocarbons - a starting material for heat resistant plastics

SOURCE:

Vsesoyuznoye soveshchaniye po khimicheskoy pererabotke neftyanykh uglevodorodov v poluprodukty dlya sinteza volokon i plasticheskikh mass. Baku, 1957. Baku, Izd-vo AN Azerb.SSR, 1960. 157-169

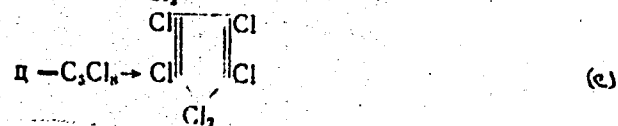
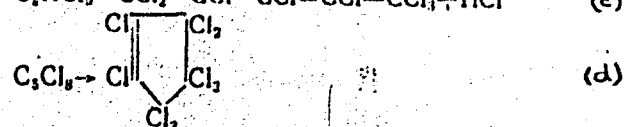
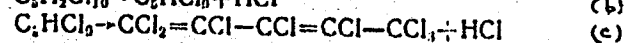
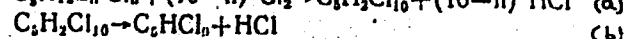
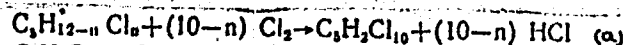
TEXT: A content of 78% chlorine and the presence of conjugated double bonds in the molecule of hexachlorocyclopentadiene open possibilities for the production, on the basis of this chlorocarbon, of low-cost polymer compounds with high heat resistance and thermal stability. With this in view, the preparation of hexachlorocyclopentadiene by chlorination of pentanes has been studied at the laboratory headed by Professor N.N.Mel'nikov at NIUIFe. The study was conducted in three stages: 1) establishment of the course of the chemical reactions; 2) thermodynamic analysis of these reactions; and 3) development, on the basis of the thermodynamic analysis, of the technological principles of the process. Of the Card 1/4

32570

S/595/60/000/000/005/014
E196/E485

Preparation of hexachlorocyclo- ...

several theoretically possible methods of preparation, the only one of industrial importance is the chlorination of compounds containing either a five membered ring or a five membered open chain. The latter raw material is economically more attractive, as it includes the readily available n-pentane, methylbutane and the corresponding olefins. Tetramethyl methane (neopentane) is unsuitable for this reaction. With n-pentane and chlorine as starting materials, the reaction mechanism can be resolved into five stages



Card 2/4

Preparation of hexachlorocyclo- ...

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S/595/60/000/000/005/014
E196/E485

Experiments confirmed the conclusion reached by the thermodynamic calculations with regard to the efficiency of dividing the reaction space into two zones in order to obtain maximum yield: zone one, in which the irreversible chlorination reactions of pentane to octachlorocyclopentene and partial dechlorination of the latter take place, and zone two, in which the reversible dechlorination of octachlorocyclopentene is completed. It was found that a maximum yield of 70 to 75% requires above zero temperatures for the reaction in zone one, a high temperature (500°C) in zone two, the presence of an inert gas during the reactions, and recirculation of the octachlorocyclopentene. Higher temperature is undesirable as it leads to the formation of hexachlorobenzene. It was found experimentally that by using infusional earth as catalyst, diluting the reactants with nitrogen and recycling the intermediate octachlorocyclopentene, a 70 to 75% yield of hexachlorocyclopentadiene was obtained at a reactor temperature of 370°C. The same process applied to the production of hexachlorocyclopentane gives yields of 85 to 90%. The reactor used in this investigation was a tube of 20 mm diameter, 870 mm long. The rate of feed of polychloropentanes was 1.0 to

Card 3/4

X

32570

S/595/60/000/000/005/014
E196/E485

Preparation of hexachlorocyclo- ...

1.2 g/min. N.M.Burmakin and N.V.Chernyak participated in the experiments. M.Kh.Karapet'yants, A.A.Vvedenskiy, V.V.Korobov, A.V.Frost, A.L.Englin and M.V.Skibinskiy are mentioned in the article in connection with their contributions in the field of hexachlorocyclopentadiene production. There are 10 figures, 6 tables and 14 references: 3 Soviet-bloc and 11 non-Soviet-bloc. The four most recent references to English language publications read as follows: Ref.5: Bjorkstew J., Tovey H., Harker B., Henning J. Polyesters and their applications. Reinhold Publishing Corp. New York, 1956; Ref.12: Reeves W.A., Guthrie J.D. Ind. Eng. Chem. 48, 64, 1958; Ref.13: Robitschek P. Ind. Eng. Chem., 46, 1658, 1954; Ref.14: Robitschek P., Nelson S.J. Ind. Eng. Chem. 48, 1951, 1956.

Card 4/4

S/080/62/035/003/014/024
D227/D302AUTHORS: Kogan, L. M. and Ignatova, N. P.

TITLE: Extensive chlorination of butane

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 3, 1962, 593-601

TEXT: The authors wished to establish the character of the continuous chlorination of butane in a solvent medium. Solvents used were CCl_4 , hexachlorobutadiene or polychlorobutanes and the chlorination reaction was initiated by the introduction of free radicals. In studying the effect of the initiator the authors have found that to maintain a steady reaction the initiator should be added in small quantities throughout the process. The reaction has also been found to depend on the molar ratio of chlorine to butane and the best results were obtained when this ratio was equal to 5 and the residence time of the intermediate products substantially increased. It was shown that at 80°C the average Cl content in the molecule of polychlorobutane was equal to the ratio of Cl : butane used. The degree of Cl bonding showed a maximum at 80°C while at the same

Card 1/3

Extensive chlorination of butane

S/080/62/035/003/014/024
D227/D302

time optimum temperature for butane adsorption was 50°C. The effect of the rate of delivery of the starting materials on the reaction was determined while maintaining the volume of the reaction medium constant. Practically 100% consumption of butane occurred when this rate was maintained at 0.43 mol./l.hr. allowing residence time of 14 hours. To ensure the fullest possible utilization of chlorine and butane and to obtain higher polychlorobutanes with the required number of Cl atoms in the molecule, the process of chlorination must be carried out in two stages. There are 8 figures, 2 tables and 8 references: 4 Soviet-bloc and 4 non-Soviet-bloc. The references to the English-language publications read as follows: E. T. McBee and R. E. Hatton, Ind. Eng. Ch., 41, 809, (1949); E. H. Huntress, The preparation, properties, chemical behavior and identification of organic chlorine compounds. N.Y. - London (1948).

ASSOCIATION: Nauchnyy institut po udobreniyam i insektofungicidam i Kafedra khimicheskoy tekhnologii MGU (Scientific Institute for Studies of Fertilizers, Insecticides

Card 2/3

Extensive chlorination of butane

S/080/62/035/003/014/024
D227/D302

and Fungicides, and Department of Chemical Technology
of the MGU)

SUBMITTED: July 30, 1960

Card 3/3

KOGAN, L.M.; BURMAKIN, N.M.; IGNATOVA, N.P.; CHERNYAK, N.V.

Development of technological process in the preparation of
hexachlorocyclopentadiene. [Trudy] NIUIF no.164:6-8 '59.
(MIRA 15:5)
(Cyclopentadiene)

ROGAN, L.M.; IGNATOVA, N.P.

Extensive chlorination of butane. Zhur.prikl.khim. 35 no.3;
593-601 Mr '62. (MIRA 15:4)

1. Nauchnyy institut po udobreniyam i insektotsifitsidam i Kafedra
khimicheskoy tekhnologii Moskovskogo gosudarstvennogo universiteta.
(Butane) (Chlorination)

KOGAN, L.M.; BURMAKIN, N.M.

Certain regularities of the reaction producing hexachloro-
butadiene. Zhur.prikl.khim. 35 no.7:1609-1617 J1 '62.

(Butadiene)

(MIRA 15:8)

KOGAN, L. M.

Design of a ferromagnetic sonda. Priboestroenie no.12:6-8
D '62. (MIRA 16:1)

(Magnetic instruments)

KOGAN, L.M.; IGNATOVA, N.P.

Initiation of the reaction of extensive chlorination of butane and its chloro derivatives by means of butylene and divinyl. Zhur.ob.khim. 33 no.3:883-886 Mr '63. (MIRA 16:3)

1. Nauchnyy institut po udobreniyam i insektofungitsidam i Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.
(Butane) (Chlorination) (Butadiene)

KOGAN, L.M.

One approach to the search for chemical means for the protection of useful plants. Zhur. prikl. khim. 36 no.4:824-830 Ap '63.

(MIRA 16:7)

1. Nauchno-issledovatel'skiy institut po udobreniyam i insektofungisidam.

(Pesticides--Toxicology)

ARKHIPOVA, L.V.; VOL'FKOVICH, S.I.; IGNATOVA, N.P.; KOGAN, L.M.; STRO-
ganov, N.S.

Use of hexachlorobutadiene for combating "blooming" of industrial
water. Khim.prom. no.7:498-501 J1 '63. (MIRA 16:11)

1. Moskovskiy gosudarstvennyy universitet i Vsesoyuznyy nauchno-
issledovatel'skiy institut khimicheskikh sredstv zashchity ras-
teniy.

KOGAN, L.M.; KOL'TSOV, N.S.; LITVINOV, N.D.

Solubility of chlorine and carbon dioxide in hexachlorobutadiene.
Zhur.fis.khim. 37 no.8:1875-1877 Ag '63. (MIRA 16:9)

1. Nauchnyy institut po udobreniyam i insektofungisidam.
(Chlorine) (Carbon dioxide) (Butadiene)

KOGAN, L.M.; KOL'TSOV, N.S.; LITVINOV, N.D.

Apparatus for determining the solubilities of chlorine and other
gases in liquids. Zhur.fis.khim. 37 no.8:1914-1917 Ag '63.
(MIRA 16:9)

1. Nauchnyy institut po udobreniyam i insektofungitsidam.
(Chlorine) (Gases) (Solubility)

ACCESSION NR: AP4028444

S/0181/64/006/004/1145/1151

AUTHORS: Kogan, L. M.; Meskin, S. S.; Goykhman, A. Ya.

TITLE: Diffusion of cadmium and zinc into gallium arsenide from the gas phase

SOURCE: Fizika tverdogo tela, v. 6, no. 4, 1964, 1145-1151

TOPIC TAGS: diffusion, gallium arsenide, surface concentration, semiconductor, penetration depth, error function

ABSTRACT: Determinations were made by electrical conductivity. It was found that the distribution of Cd with depth of the diffusion layer is described by error functions. The surface concentration in the temperature interval of diffusion (900-1100C) at a concentration of Cd vapor of $0.65 \cdot 10^{19}$ to $1.5 \cdot 10^{19} \text{ cm}^{-3}$ is found to be $1 \cdot 10^{19}$ to $4 \cdot 10^{19} \text{ cm}^{-3}$. The coefficient of diffusion of Cd is related to temperature by the expression $D = 0.05 \exp \left(- \frac{2.8}{kT} \right)$. The curve showing penetration of Zn into GaAs is anomalous. At first, the depth of penetration depends on the temperature of the vapor source during diffusion. The latter part of the

Card 1/3

ACCESSION NR: AP4028444

penetration curve may be defined by error functions. For this segment, the coefficient of diffusion is related to temperature by $D = 3 \cdot 10^{-7} \exp(-\frac{1}{kT})$.

The surface concentration of Zn depends on the temperature of the vapor source but does not depend on the diffusion temperature (within the investigated interval of 800-1100°C). The maximal surface concentration of Zn amounts to $3.5 \cdot 10^{20} \text{ cm}^{-3}$. The authors also investigated the effect of vapor pressure of As on the diffusion of Zn. A change in vapor pressure of As from 0.2 to 0.8 atm has no effect on the shape of the penetration curve or on the surface concentration of Zn. Measurements of the Hall constant and the resistivity in samples having the p layer ground off show that the initial properties of the sample do not change during diffusion. "The authors take this opportunity to express their thanks to D. M. Nasledov for his interest in the work and his valuable suggestions, and they thank B. I. Boltaks and B. V. Tsarenkov for their useful discussions on results of the work." Orig. art. has: 8 figures, 2 tables, and 10 formulas.

ASSOCIATION: none

SUBMITTED: 04 Nov 63

DATE ACQ: 27 Apr 64

ENCL: 00

Card 2/3

ACCESSION NR: APL028444

SUB CODE: EC, SS

NO REF SOV: 003

OTHER: 005

Card 3/3

KOGAN, L.M.; MESKIN, S.S.; TRISHINA, V.Ye.

Features of p-n junctions in Ga arsenide derived by cadmium
diffusion. Radiotekh. i elektron. 9 no.11:2042-2044 N '64.
(MIRA 17:12)

KOGAN, Leonid.M.; ULEZLO, I.V.; KOZLOVA, I.K.; SUVOROV, N.N.; PORTNOVA, S.L.
SKRYAGIN, O.K.; TROGOV, I.V.

Microbiological transformations of steroids. Report No.3: Reduction of 17 α , 21-deoxysteroids by *Actinomyces albus* 3006. Izv. AN SSSR Ser. khim. no.11:2008-2015 N '64 (MIRA 18:1)

1. Institut khimii prirodnnykh soedineniy AN SSSR i Institut mikrobiologii AN SSSR.

KOGAN, L.M.; BURMAKIN, N.M.

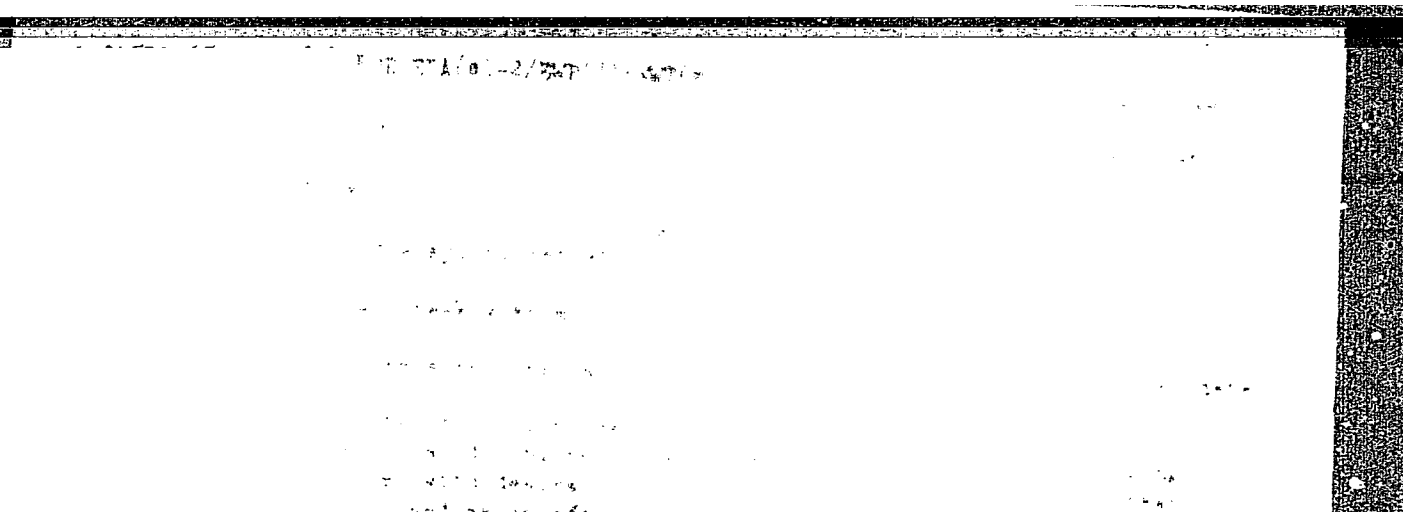
Certain regularities of the reaction by which hexachlorocyclopentadiene is obtained from polychlorocyclopentanes. Zhur. prikl. khim. 37. no. 4:869-873 Ap '64. (MIRA 17:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh sredstv zashchity rasteniy.

KOGAN, L.M.; RABOVSKAYA, N.S.; VOL'PKOVICH, S.I., akademik

Radiolysis of tetrachloroethylene and hexachlorobutadiene.
Dokl. AN SSSR 157 no.1:127-130 J1 '64 (MIRA 17:8)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova
i Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh
sredstv zaschity rasteniy.



"APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723610014-7

APPROVED FOR RELEASE: 09/18/2001

CIA-RDP86-00513R000723610014-7

KOGAN, L.M., inzh.

Ferrosende vibrometer. Priborostroenie no.2:27-28 P '65.
(MIRA 18:3)

TIBANOV, P.V.; VASIL'YEV, A.F.; KOCAN, L.M.; BURMAKIN, N.M.

Quantitative analysis of products of exhaustive chlorination of pentanes based on infrared spectra. Zav. lab. 31 no.2:172-176 '65. (MIRA 18:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh sredstv zashchity rasteniy.

SHAKHNOVICH, M.I., kand.tekhn.nauk; KOGAN, L.M., kand.tekhn.nauk; BESSKOVA,
Ye.I., inzh.

Hexachlorobutadiene, an electrically insulating and cooling
liquid for transformers. Elektrotehnika 36 no.2:30-32 F '65.
(MIRA 18:4)

KOGAN, L.M.; BURMAKIN, N.M.

Chlorination of hexachlorocyclopentadiene. Zhur. - 1kl. khim.
38 no.1:207-208 - Ja 1965. (MIRA 18:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy ts. khimicheskikh
zashchity rasteniy.

KOGAN, L.M.; ROZHKOVA, N.G.; RABOVSKAYA, N.S.

Extensive chlorination of piperylene. Zhur.prikl.khim. 38 no.6:1315-
1320 Je '65. (MIRA 18:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh
sredstv zashchity rasteniy.

KOGAN, L.M.; VOLKOVA, I.M.; VOYSHVILLO, N.Ye.; TORGOV, I.V.; SKRYABIN, G.K.

Transformation of estradiol into estrone by actinomycetes. Izv.
AN SSSR. Ser. biol. no.2:285-287 Mr-Apr '65.

(MIRA 18:4)

1. Institute of Chemistry of Natural Compounds and Institute of
Microbiology, Academy of Sciences of the U.S.S.R., Moscow.

RAZUVAYEV, G.A.; SANGALOV, Yu.A.; MINSKER, K.S.; KOGAN, L.M.; RABOVSKAYA, N.S.

Initiation of vinyl chloride polymerization by reactions between lower unsaturated chlorocarbons and triethylaluminum. Dokl. AN SSSR 160 no.1:143-144 Ja '65. (MIRA 18:2)

1. Moskovskiy gosudarstvennyy universitet. 2. Chlen-korrespondent AN SSSR (for Razuvayev).

KOGAN, Leonid M.; VOYSHVILLO, N.Ye.; SKRYABIN, G.K.; TORGOV, I.V.

Hydroxylation of steroids - a new reaction for actinomycetes.
Dokl. AN SSSR 160 no.2:346-348 Ja '65.

(MIRA 18:2)

1. Institut khimii prirodnnykh soyedineniy AN SSSR. Submitted
August 28, 1964.

KOGAN, Leonid M.; ULEZLO, I.V.; YELIN, E.A.; BARMENKOV, A.S.; SKRYABIN, G.K.;
TORGOV, I.V.

Study of the transformation of steroids with the help of *Actinomyces*
albus 3006. Izv. AN SSSR. Ser. biol. no.4:581-584 J1-Ag '65.

(MIRA 18:7)

1. Institut khimii prirodnnykh soedineniy AN SSSR i Institut mikro-
biologii AN SSSR.

L 35855-66 EWT(1)

ACC NR: AP6015340

SOURCE CODE: UR/0119/66/000/005/0005/0006

AUTHOR: Kogan, L. M. (Engineer)

ORG: none

TITLE: Digital difference analog as function generator *nf*

SOURCE: Priborostroyeniye, no. 5, 1966, 5-6

TOPIC TAGS: function generator, difference equation

ABSTRACT: The conventional digital analog generates a function by solving a differential equation. A new digital difference analog generates a function by solving the corresponding difference equation by the method of lowering its order. The circuit is based on an accumulator describable by this formula:

$\Delta' y[n] = \sum_{i=0}^{n-1} \Delta^{i+1} y[i] - \Delta' y[0]$, where $\Delta' y[0]$ is the initial value of the unknown difference

Card 1/2

UDC: 681.142.644.6

L 35855-66

ACC NR: AP6015340

and $\Delta y[n]$ is the difference after n intervals. The transfer function of the analog is given as: $\Phi = \frac{1}{(e^T - 1)Y}$, which shows that the analog should include r series-connected accumulators and one register $\Delta^r y$. A block diagram of the new function generator is given; simpler construction, clock frequencies of 5-6 Mc, and sufficient accuracy are claimed. Orig. art. has: 1 figure and 6 formulas.

SUB CODE: 09 / SUBM DATE: none / ORIG REF: 003

Card 2/2 *llb*

L 4212 -56 EWT(1)/EWT(m)/T/EWP(t)/ETI IJP(c) AT/JD/JG

ACC NR: AP6026705

SOURCE CODE: UR/0181/66/008/008/2462/2465

AUTHOR: Danilova, T. N.; Kogan, L. M.; Maslin, S. S.; Nasledov, D. N.; Tsarenkov, B. V.

ORG: Physics-Engineering Institute im. A. F. Ioffe, AN SSSR, Leningrad (Fiziko-
tekhnicheskii institut AN SSSR)

TITLE: Comparative investigation of the recombination radiation of GaAs p-n junctions with and without a Fabry-Perot resonator

SOURCE: Fizika tverdogo tela, v. 8, no. 8, 1966, 2462-2465

TOPIC TAGS: ~~Fabry-Perot~~ resonator, recombination radiation, *transition*, pn ~~diode~~, gallium arsenide, *diode*

ABSTRACT: The published literature contains information on the investigation of spontaneous, stimulated, and coherent radiation of GaAs p-n junctions pertaining to the characteristic radiation parameters as a function of the current for diodes with or without resonators. The purpose of the present article is to compare the dependences of the maximum energy $h\nu_M$ and the half-width δ of the fundamental radiation band on the current density through a single p-n junction with and without a Fabry-Perot resonator. The authors studied diodes in which the p-n junctions were obtained by diffusion of zinc in Te-alloyed n-GaAs with electron concentration $7 \cdot 10^{17} - 3 \cdot 10^{18} \text{ cm}^{-3}$; the area of the p-n junction $\approx 10^{-3} \text{ cm}^2$. The current through the diode and the spectral distribution of radiation intensity were measured. It was found that $h\nu_M$, starting

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ACC NR: AP6026705

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from the lowest current densities (≥ 5 a/cm²), increases with increasing current and then becomes practically independent of the current. The dependence of δ on current density is given for small current densities (5--70 a/cm²). It is concluded from the results presented that the primary narrowing of the spectrum occurs as a result of population inversion at the rarefied states which are responsible for the secondary narrowing of the spectrum, i.e., beyond the conventional stimulated and coherent radiation with maximum energy ≈ 1.47 ev. The "tails" in the forbidden zone are probably the rarefied states responsible for the primary narrowing of the spectrum. The authors thank O. V. Konstantinov, V. I. Peral', and A. L. Efros for discussing the results of this work. Orig. art. has: 2 figures. [26]

SUB CODE: 20/ SUBM DATE: 26Jan66/ ORIG REF: 001/ OTH REF: 001/ ATD PRESS: 5064

Card 2/21116

L 44602-66 EWT(1)/EWT(m)/EEC(k)-2/T/EWP(k)/EWP(t)/Eti IJP(c) WG/JD/JC

ACC NR: AP6030977

SOURCE CODE: UR/0181/66/008/009/2789/2791

AUTHOR: Kogan, L. M.; Libov, L. D.; Nasledov, D. N.; Nikitina, T. F.;
Strakhovskiy, G. M.; Tsarenkov, B. V.

ORG: Physicotechnical Institute im. A. F. Ioffe, AN SSSR, Leningrad (Fiziko-
tekhnicheskiy institut AN SSSR); Physics Institute im. P. N. Lebedev AN SSSR, Moscow.
(Fizicheskiy institut AN SSSR)

TITLE: Certain properties of GaAs laser diodes with an epitaxial p-n junction at
room temperature

SOURCE: Fizika tverdogo tela, v. 8, no. 9, 1966, 2789-2791

TOPIC TAGS: solid state laser, semiconductor laser, gallium arsenide, laser, epitaxial
diode, infrared laser, PN JUNCTION, EPITAXIAL GROWING

ABSTRACT: In an experimental investigation of epitaxial p-n GaAs junctions, tellurium-
doped n-type and zinc-doped p-type GaAs was used. The electron concentration in the
n-type GaAs was $5.5 \times 10^{17} - 2.4 \times 10^{18} \text{ cm}^{-3}$; the hole concentration in the p-type GaAs
was $1.5 \times 10^{18} - 2.4 \times 10^{19} \text{ cm}^{-3}$. The specimens were oriented along the (100) plane
and the epitaxial p-n junction was prepared from the liquid phase by a method described
elsewhere (H. Nelson, RCA Rev., 24, 603, 1963). The dislocation density near the p-n
junction in the epitaxial layers did not exceed that in the wafer and was 10^4 cm^{-2} .
The Fabry-Perot cavity was formed by the cleaved (110) surfaces, and the electrical

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ACC NR: AP6030977

contacts were made of indium. The residual resistance of a diode with an area of 10^{-3} cm^2 was less than 0.1 ohm. Laser action at room temperature was achieved with 30-nanosec current pulses. An FEU-22 photomultiplier recorded the optical output. The threshold currents were determined from the dependence of intensity on current. The p-type GaAs specimens with hole concentrations of $2.4 \times 10^{19} \text{ cm}^{-3}$ and a mobility of $50 \text{ cm}^2/\text{v}\cdot\text{sec}$ lased at 9000 \AA at threshold currents of $1.5 \times 10^5 \text{ amp/cm}^2$. Investigations were also made of specimen in which the epitaxial layer, doped with zinc and partly compensated by lead, was grown on a tellurium-doped GaAs substrate with an electron concentration of $9.5 \times 10^{17} \text{ cm}^{-3}$ and a mobility of $2400 \text{ cm}^2/\text{v}\cdot\text{sec}$. These lased at room temperature at 9010 \AA at currents of $3.8 \times 10^5 \text{ amp/cm}^2$ and at 8910 \AA at currents of $4.7 \times 10^5 \text{ amp/cm}^2$ and up. The power per pass of p-GaAs lasers was 30 watts with 700-amp currents and 18-nanosec pulses; that of n-GaAs lasers was 10 watts with 300-amp currents and 30-nanosec pulses. Orig. art. has: 1 figure. [YK]

SUB CODE: 20/ SUBM DATE: 25Mar66/ ORIG REF: 001/ OTH REF: 003/ ATD PRESS:
5078

Card 2/2 2/27

L 46952-66 EMT(1)/EM(M)/EBC(K)-2/T/EMF(t)/ETI IJP(c) JD/JG

ACC NR: AP6031029

SOURCE CODE: UR/0109/66/011/009/1645/1650

AUTHOR: Kogan, L. M.; Moskin, S. S.; Nasledov, D. N.; Trushina, V. Ye.; Tearenkov, B. V.

ORG: Physico-Technical Institute im. A. F. Ioffe, AN SSSR (Fiziko-tehnicheskiy institut AN SSSR)

TITLE: Electron-photon ¹¹GaAs ¹¹transistor ₂₅

20
B

SOURCE: Radiotekhnika i elektronika, v. 11, no. 9, 1966, 1645-1650

TOPIC TAGS: transistor, electron photon transistor, gallium arsenide transistor, *GALLIUM ARSENIDE, ELECTRON, PHOTON*

ABSTRACT: The results of an experimental investigation of GaAs electron-photon transistors (R. Rediker et al., Proc. IEEE, 1973, 51, 1, 218) at 77 and 293K are reported. The transistors were made from Te-doped n-GaAs. Source material parameters: electron concentration, 7×10^{17} -- 5×10^{18} per cm^3 ; mobility, 1800--3200 $\text{cm}^2/\text{v sec}$; dislocation density, 10000 per cm^2 ; p-n-p structure was produced by Zn diffusion; plate thickness, 300 μ ; base thickness, 100-200 μ ; p-region thickness, 50--100 μ . Collector current vs. collector voltage characteristics (for 0--100 amp/cm^2 emitter current) and collector current vs. emitter current characteristics are shown. The emitter-collector current transfer ratio was found to increase from 0.05 to 0.075 with the collector voltage increasing from 0 to 8 v, at 77K. At room temperature, the transfer ratio amounts to 1/20-th of the liquid-nitrogen ratio. When the emitter

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ACC NR: AP6031029

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current increases from 0.1 to 0.5 amp, the power gain decreases from 12 to 4 and the voltage gain, from 350 to 80 (at 77K). The estimated total quantum yield of photons is 0.1 at 77K. Desirability is noted and ways are indicated for making the electron-photon transistor a practical amplifier. Crig. art. has: 4 figures and 1 formula.

[03]

SUB CODE: 09 / SUBM DATE: 29Mar65 / ORIG REF: 003 / OTH REF: 006 / ATD PRESS: 5089

Card 2/2 afs

ACC NR: AP6032018

SOURCE CODE: UR/0386/66/004/006/0208/0210

AUTHOR: Kogan, L. M.; Libov, L. D.; Nasledov, D. N.; Nikitina, T. F.; Orayevskiy, I. N.; Strakhovskiy, G. M.; Sungurova, O. A.; Tsarenkov, B. V.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences, SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Continuous coherent radiation of epitaxial diodes of GaAs at 77K

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. ²⁷ Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 6, 1966, 208-210

TOPIC TAGS: gallium arsenide, epitaxial growing, pn junction, semiconductor laser, emission spectrum, recombination emission

ABSTRACT: The authors report continuous generation from a GaAs semiconductor laser with epitaxial pn junction operating with the medium at 77K. The junction was produced by liquid epitaxy by the method of H. Nelson (RCA Rev. v. 24, 603, 1963). The epitaxial layer was doped with tellurium to a density $\sim 5 \times 10^{18} \text{ cm}^{-3}$. A Fabry-Perot type resonator was produced by cleavage along the (110) plane. Emission values of the spectra of the same diode, obtained at different values of the exciting current, in pulsed or continuous operation, show that the maximum of the recombination spectrum shifts toward shorter wavelengths with increasing current; this shift is due to the "dispersal" of the Fermi quasilevels with increasing pump energy, and also to the shift to the long-wave section of the spectrum in the continuous mode, relative to

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ACC NR: AP6032018

the spectrum in the pulsed mode, connected with the constant heating of the active region in the continuous case. This difference between the spectra in the two modes is larger for small currents and decreases on approaching the threshold current. The latter effect is connected with the presence of deep electronic levels with very low state density. Coherent radiation in the continuous mode occurs at a current of 250 ma (612 a/cm^2). The narrow spectral line appearing in this case corresponds most probably to the non-axial "annular" type of resonator oscillations. At 410 ma (1020 a/cm^2), a new system of coherent lines appears, which can be interpreted as corresponding to axial modes of the cavity. The total emission power of the diode for which the spectra are presented is 5 mW at the appearance of the first coherent line and 70 mW at a current 1.5 a. Orig. art. has: 1 figure. [02]

SUB CODE: 20/ SUBM DATE: 13Jun66/ OTH REF: 002/ ATD PRESS: 5084

Card 2/2

BOL'SHAKOV, K.A.; SAFONOV, V.V.; KOGAN, L.M.; SHEVTSOVA, Z.N.; SHADROVA, L.G.

Solubility of chloro derivatives of some metals in 1,3-hexachlorobutadiene. Zhur. fiz. khim. 38 no.5:1305-1306 My '64. (MIRA 18:12)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni Lomonosova i Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh sredstv sashchity rasteniy. Submitted June 7, 1963.

14941-66 ENT(m)/EWP(e)/EWP(b) IJP(c) JD/JG

ACC NR: AP5026913

SOURCE CODE: UR/0109/65/010/010/1912/1914

AUTHOR: Kogan, L. M.; Meskin, S. S.

ORG: none

TITLE: Electrical characteristics of gallium-arsenide p^+ -p-n diodes

SOURCE: Radiotekhnika i elektronika, v. 10, no. 10, 1965, 1912-1914

TOPIC TAGS: semiconductor diode, GaAs diode

ABSTRACT: The results of an experimental investigation of GaAs diodes are reported. The p^+ -p-n-structure was prepared by diffusing Mn and Cd into n-GaAs with $n_n = (1-2) \times 10^{17}$ per cm^2 and $\mu_n = 3100-3400$ $cm^2/v.sec$. At 300-373K, the forward branch of the d-c-measured I-V characteristic was similar to that of conventional p-n junctions prepared by Zn or Cd diffusion. The depletion region thickness was found to be 3-8 microns and 20-25 microns at 293K and 77K, respectively. A negative-resistance region appears in the forward branch at low temperatures, such as 77K (as was observed by K. Weiser et al., Bull. Am. Phys. Soc., 1963, 8, 3, 201); at a positive bias of 1-2 v, the I-V characteristic is linear; at a

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UDC: 621.382.2

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ACC NR: AP5026913

higher bias, the characteristic becomes nonlinear. The reverse branch of the I-V characteristic at room temperature obeys the law $I \approx U^n$, where $n = 1.1-1.5$ for 0-30 v; at 77K, the characteristic is linear within a considerable voltage interval. Similar characteristics were observed in p-n junctions prepared by diffusing Fe into n-GaAs. "The authors wish to thank B. V. Tsarenkov for his useful advice, and D. N. Nasledov for his interest in the work." Orig. art. has. 3 figures.

SUB CODE: 09 / SUBM DATE: 21Oct64 / ORIG REF: 001 / OTH REF: 003

Card 2/2

I 3928-66 EMT(1)/EMT(m)/T/EMP(t)/EMP(b)/EWA(h) IJP(c)
ACC NR: APS025300 SOURCE TCTF

Q1010 3115-3118

A. M. Imenkov, A. N.; Kogan, L. M.; Kozlov, M. M.; Meskin, D. S.; Maslakov, D. N.;
Tsarenkov, B. V.

82
24.5

Physicotechnical Institute im. A. F. Ioffe, AN SSSR, Leningrad Fiziko-tekhnicheskii institut im. A. F. Ioffe

TITLE: The effect of impurities on the recombination radiation of gallium arsenide

SOURCE: Fizika tverdogo tela, v. 7, no. 10, 1965, 3115-3118

TOPIC TAGS: recombination radiation, gallium arsenide, pn junction, impurity, acceptor, donor

ABSTRACT: The effect of Zn, Cd, Mn, and Fe impurities on the recombination radiation of GaAs p-n junctions was experimentally investigated. The junctions were formed by direct diffusion of the element, by simultaneous diffusion of Mn and Cd and Fe and Cd, or by diffusion of Mn and then Cd, or Fe and then Cd into n-type GaAs with an electron concentration (N_D) of $5 \times 10^{16} - 3 \times 10^{18} \text{ cm}^{-3}$ crystals with $N_D = 3 \times 10^{17} \text{ cm}^{-3}$. The junction area was 1 mm^2 . The recombination spectra were measured at 77 and 300 K in the photon energy range 0.7-1.4 eV. The spectra were recorded at three different angles of observation. The length of the band was independent of the element. The experimental data are given in Table 1. The band with $\lambda_{\text{max}} = 1.1 \text{ eV}$ and $\lambda_{\text{max}} = 0.95-0.98 \text{ eV}$.

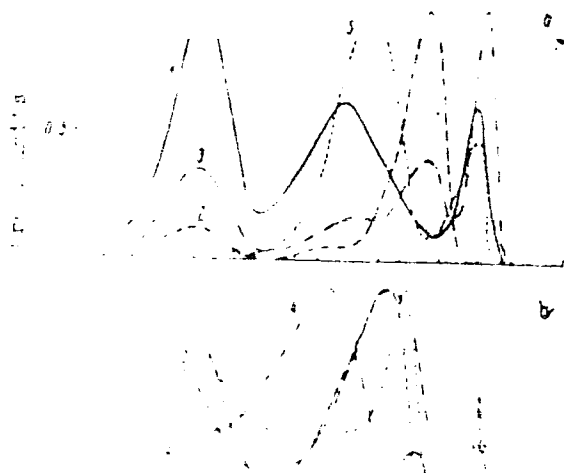


Fig. 1. Recombination radiation of n-GaAs p-n junction doped with:

1 - Cd; 2 - Mn; 3 - Mn and then Cd;
4 - Fe; 5 - Fe and then Cd;
6 - Fe and then Cd. The at-
tenuation of intensity differs
from specimen to specimen.

I. 3928-66

ACC NR: AP5025399

Table 1. Photon energy in the band peaks ($h\nu_{\text{MAX}}$) and band halfwidths

Impurity	ν, cm^{-1}	Emission Band	λ, nm	$\Delta\lambda, \text{nm}$
Zn $5 \cdot 10^{18} < n_e < 7 \cdot 10^{18} \text{ cm}^{-3}$	77	1.48-1.47 (0.015-0.022)	80-82	0.97
	293	1.38-1.36 (0.035-0.050)	—	0.97 (0.14)
Zn $1 \cdot 10^{18} > n_e > 10^{18} \text{ cm}^{-3}$	77	1.47-1.46 (0.022-0.030)	1.20-1.26	1.02 (0.12)
	293	1.38-1.36 (0.035-0.050)	—	0.97 (0.14)
Cd	77	1.48-1.46 (0.025-0.045)	0.75	0.81 (0.12)
	293	1.38-1.36 (0.040-0.060)	—	0.97 (0.14)
Mn	77	—	1.39-1.34 (0.008-0.008)	1.02 (0.12)
	293	—	1.11-1.11 (0.001-0.001)	0.96 (0.12)
$\text{Mn} + \text{Cd}$	77	1.47 (0.045)	1.85-1.26	0.97 (0.12)
	293	1.37-1.32 (0.14-0.05)	—	0.97 (0.12)
Fe	77	—	1.38	0.81
	293	—	1.22 (0.15)	0.97-0.95
$\text{Fe} + \text{Cd}$	77	1.46 (0.045)	1.38	0.81
	293	1.38	—	0.97 (0.16)

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...ed the band with $h\nu_{\max} \approx 1.25$ ev, clearly defined at 17V as ... as ... and ... and less sharply defined ... and ... were ... observation energies of 0.5 and 0.25 ev, respectively. Orig. art. has: 2 figures and 1 table.

[CS]

EX-107 COMMA

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Card 1/4

KOGAN, Leonid.M.; YELIN, E.A.; BARMENIKOV, A.S.; TORGOV, I.V.

Microbiological transformations of steroids. Report No.4:
Oxidation of pregnenolone by means of *Rhizopus nigricans*
VNIKhFI-7. Izv. AN SSSR Ser. khim. no.11:2016-2021 N '64

(MIRA 18:1)

1. Institut khimii prirodnikh soyedineniy AN SSSR.

KOGAN, Leonid, M.; YELIN, E.A.; VOYSHVILLO, N.Ye.

Substrate specificity of microbiological transformations of steroids induced with the help of *Actinomyces albus* 3006. Dokl. AN SSSR 159 no.4:926-927 D '64 (MIRA 18:1)

1. Institut khimii prirodnikh sovedineniy AN SSSR. Predstavleno akademikom M.M. Shemyakinym.

KOGAN, L. N.

Tvorcheskaia initsiativa rabocheho klassa SSSR v sotsialisticheskom
trude/ Creative initiative in socialist labor of the working class of the
U. S. S. R. / Sverdlovsk, Sverdlovskoe obl. gos. izd-vo, 1952. 65 p.

SO: Monthly List of Russian Accessions. Vol. 6 No. 7 October 1953

KOGAN, Lev Naumovich, kandidat filosofskikh nauk; KOVTUN, Yu.Ye.; ISLENT'-
YEVA, P.G., tekhnicheskiy redaktor

[Creative initiative of Soviet workers in socialist production]
Tvorcheskaya initsiativa trudiashchikhsia SSSR v sotsialisticheskoy
proizvodstve. Moskva, Izd-vo "Znanie," 1955. 30 p. (Vsesoyuznoye
obshchestvo po rasprostraneniyu politicheskikh i nauchnykh
znaniy, Ser.2, no.18). (MIRA 8:7)

(Efficiency, Industrial)